

Du'Bois J. Ferguson  
Remediation Manager

Schlumberger Oilfield Service  
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Sugar Land, TX 77478  
Tel: 281-285-3692  
[DFerguson3@slb.com](mailto:DFerguson3@slb.com)

January 9, 2012

VIA FedEx Overnight

Section Chief  
Environmental Enforcement Section  
U.S. Department of Justice  
PO Box 7611  
Washington, DC 20044-7611

Craig Zeller  
Remedial Project Manager  
Superfund Division  
U.S. EPA Region 4  
61 Forsyth Street, SW  
Atlanta, GA 30303

Re: DOJ Case No. 90-11-2-696/1

Subject: Fourth Quarter 2011 Progress Report  
Sangamo Weston/Twelvemile Creek/Lake Hartwell Superfund Site  
Natural Resources Trustees Consent Decree

Dear Section Chief:

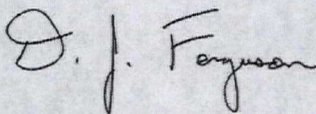
In accordance with the Consent Decree and Section XIV of the Unilateral Administrative Order for the above referenced site, Schlumberger is required to submit Progress Reports on a quarterly basis. Given the pace of activities during construction, Progress Reports were submitted on a monthly basis through October 2011; this Fourth Quarter 2011 Progress Report describes activities performed during the fourth quarter since the October 2011 Monthly Report.

In keeping with Paragraph 20 of the Consent Decree:

I certify that the information contained in or accompanying this submission is true, accurate and complete. This certification is based on my personal preparation, review, or analysis of the submission, and/or supervision of persons who, acting on my instructions, made the verification that the submitted information is true, accurate and complete.

If you have any questions, please do not hesitate to contact me at (281) 285-3692.

Sincerely,



DuBois J. Ferguson  
Remediation Manager



10979063

# U.S. EPA REGION IV

## SDMS

### POOR LEGIBILITY

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cc: Honorable G. Ross Anderson, Jr.  
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and United States Courthouse  
315 South McDuffie Street, 2nd Floor  
Anderson, SC 29624

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U.S. Department of the Interior  
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Atlanta, GA 30303

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U.S. Fish and Wildlife Service  
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Greenville, SC 29602

Ms. Celeste T. Jones  
McNair Law Firm, P.A.  
Post Office Box 11390  
Columbia, SC 29211



# **Fourth Quarter 2011 Progress Report Sangamo Weston/Twelvemile Creek/Lake Hartwell Superfund Site Operable Unit 2**

**Reporting Period: November 1 through December 31, 2011**

## ***Activities Initiated/Completed***

- Completed SMU cover system installation including geosynthetic clay liner, LLDPE geomembrane, geocomposite drainage liner, soil protective cover layer and topsoil.
- Completed construction of down drains and other storm water controls at the SMU.
- Completed hydroseeding and other erosion control measures/SMU landscaping and erosion control matting activities.
- Continued survey activities.
- Initiated installation of fencing around the SMU and installed "No Trespassing" signs along the fence.
- Continued demobilization of non-essential site equipment.
- Initiated and completed installation of power line to the 30" sump.
- Initiated installation of the sump pump.
- SCDHEC Solid Waste Management Regional personnel were onsite on November 10 and December 14 for a general visit/inspection and to perform a Class Three Landfill Inspection in accordance with Regulation 61-107.19, Part V. The completed Inspection Forms are provided as Attachment 1. Minor issues were noted during these inspections, and actions were taken to address the items at issue.

## ***Results of Sampling, Tests, and Other Data***

- Sampling and analysis is being conducted relative to the water treatment system (WTS) effluent water. Results for the effluent water are attached (Attachment 2).
- Construction photographs are included as Attachment 3.

## ***Plans, Reports, and other Deliverables***

- Analytical data related to samples collected from the WTS to assess water treatment effluent water were submitted to SCDHEC monthly. Copies of the reports submitted on November 17 and December 21 are provided in Attachment 2.

### ***Work Planned for First Quarter 2012***

- Demobilize WTS and remaining equipment.
- Install historical markers at WS I and WS II.
- Complete installation of fencing around SMU.
- Complete installation of the sump pump.
- Complete construction demobilization.
- Prepare Final /As-Built Report and revise the Closure/Post Closure Care Plan.
- Submit Fourth Quarter Restoration Progress Report.

### ***Issues Encountered, Anticipated Delays, Solutions***

- Severe weather, including heavy rain, impacted field operation, and all construction activities, except water treatment, were suspended November 16 through November 18.
- No site work was performed on November 28 due to heavy rains; saturated soils continued to impact site activities on November 29.



**Attachment 1**



Class Three Landfill Inspection Form  
Regulation 61-107.19, Part V

Facility Name: 12 mile Park S.W. Date/Time of Inspection: November 10, 2011  
County: Pickens Permit #: \_\_\_\_\_  
Reason for Inspection: X Routine: \_\_\_\_\_ Follow-up: \_\_\_\_\_ Complaint: \_\_\_\_\_ Other: \_\_\_\_\_  
Current Weather Conditions: Cloudy  
Previous 24-hours Rain: YN - If yes, amount: \_\_\_\_\_ inches; High winds: YN

1 = Meets or exceeds regulatory requirements; 2A = Improvement needed (minor issues exist; corrective measures recommended); 2B = Improvement needed (moderate issues exist; corrective action required and scheduled); 3 = Unacceptable (serious issues and/or recurring issues with minimal or no corrective action taken - alleged regulatory or permit condition violations have occurred - enforcement referral required); Y = Yes; Meets or exceeds regulatory requirements; N = No; Corrective measures recommended that should be fixed by the next inspection or an agreed upon completion date; NA = Not applicable; NI = Not inspected

Procedures for Excluding Receipt of Unapproved Waste (258.20)

1. NA Overall effectiveness of Special Waste Analysis and Implementation Plan (SWAIP)
2. YN NA NI Trained waste screener present
3. YN NA NI Random daily load inspections conducted and documented
4. YN NA NI Records of unacceptable waste maintained
5. YN NA NI Personnel training program on recognition of regulated hazardous waste and PCB waste
6. YN NA NI Record of Notification to Department within 72-hours of hazardous or PCB waste receipt
7. YN NA NI Unauthorized wastes removed from working face by the end of the operating day

Cover Material Requirements (258.21)

8. NA NI  $\geq 6"$  soil (short-term cover)
9. NA NI Alternate Daily Cover (ADC)
10. NA NI  $\geq 6"$  soil (long-term and/or intermediate cover)
11. YN NA NI Adequate soil quantity available for cover

Control of (258.21, 22, 24, 25 and 37):

12. NI Blowing litter
13. NI Off-site odors
14. NI Disease vectors
15. NI Fires/Open burning
16. NI Scavenging

Access Requirements (258.25)

17. NI Condition of access controls
18. NI Condition of all weather roads - entrance
19. NI Condition of all weather - internal haul roads

Run-on/Run-off Controls (258.26)

20. NI Condition of ditches/swales
21. NI Condition of berms/terraces/downchutes
22. NI Condition of sedimentation ponds

Leachate Seeps (258.26 and 27)

23. NI Leachate seep management

Liquid Restrictions (258.28)

24. NI Free of unauthorized bulk or non-containerized liquids

Record Keeping Requirements (258.29)

25. YN NA NI Required records are maintained in the landfill's operating record

Scale Requirements (258.30)

26. YN NA NI Scales installed and functioning properly

Required Equipment to Operate Landfill (258.31)

27. YN NA NI Required equipment operational - if not please provide details in comments as to the type of equipment down for repairs, impact to operations, and status on temporary replacement equipment

Certified Landfill Manager/Supervisor (258.32)

28. YN NA NI Manager and supervisor certified by SCDHEC
29. YN NA NI Certified manager or supervisor on-site

Leachate Collection System (258.33 and 34)

30. YN NA NI Leachate handling agreement in place
31. NI Leachate collection system management
32. NI Leachate recirculation system management
33. YN NA NI Required leachate recirculation reports/data contained in the landfill's operating record

Leachate Seep Management (258.35)

34. NI Leachate seep management

Leachate Collection System Management (258.36)

35. NI Leachate collection system management

Testing of Municipal Solid Waste (MSW) Incinerator Ash (258.35)

36. YN NA NI MSW incinerator ash management

Sign Requirements (258.36)

37. YN NA NI Required signs posted

Condition of Monitoring Wells (258.51)

38. NI Monitoring well maintenance program

Working Face/Elevation (258.87)

39. YN NA NI Method of elevation control with benchmark

Plans and Permit (Permit)

40. YN NA NI Operating in accordance with approved plans and general permit
41. YN NA NI Permitted engineering drawings available
42. YN NA NI Permitted operational plan available
43. YN NA NI Permitted stabilization/landscaping plan available
44. YN NA NI Permitted contingency plan available
45. YN NA NI Permitted approved groundwater monitoring plan available
46. YN NA NI Permitted closure plan available
47. YN NA NI Permitted post-closure plan available

Name of those present during the inspection: Mark Soria

Comments: With exception to items listed below, no problems observed at the time of inspection. Site is in good compliance.

Inspection Item	Corrective action required	Date to be completed
20, 22, 24, 25	Major issues concerning sediment & erosion controls are being actively addressed at the site in accordance with approved plans.	
	Site operations & construction are in compliance with permit conditions.	
	Increasing rainfall is being monitored.	
	Following the rainfall, the site is being monitored.	

Additional comment page: YN

Photos taken: YN

The signature below certifies that the SCDHEC Inspector has personally checked each item and has answered according to the true condition existing at the time of inspection.

Hand delivered: Joe Hancock  
Facility Representative

[Signature]  
SCDHEC Inspector





Class Three Landfill Inspection Form  
Regulation 61-107.19, Part V

Facility Name: 12 mile creek SSW Date/Time of Inspection: 12/19/2011

County: Pickens Permit #: \_\_\_\_\_

Reason for Inspection: ☒ Routine: \_\_\_\_\_ Follow-up: \_\_\_\_\_ Complaint: \_\_\_\_\_ Other: \_\_\_\_\_

Current Weather Conditions: Clear

Previous 24-hours: Rain Y/N If yes, amount \_\_\_\_\_ inches; High winds Y/N

1 - Meets or exceeds regulatory requirements; 2A - Improvement needed (minor issues exist; corrective measures recommended); 2B - Improvement needed (moderate issues exist; corrective action required and scheduled); 3 - Unacceptable (serious issues and/or recurring issues with minimal or no corrective action taken - alleged regulatory or permit condition violations have occurred - enforcement referral required); Y - Yes; Meets or exceeds regulatory requirements; N - No; Corrective measures recommended that should be fixed by the next inspection or an agreed upon completion date; NA - Not applicable; NI - Not inspected

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11. Y/N NA NI Adequate soil quantity available for cover

Control of (258.21, 22, 24, 25 and 37):

12. \_\_\_\_\_ Blowing litter
13. \_\_\_\_\_ Off-site odors
14. \_\_\_\_\_ Disease vectors
15. \_\_\_\_\_ Fires/Open burning
16. \_\_\_\_\_ Scavenging

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17. \_\_\_\_\_ Condition of access controls
18. \_\_\_\_\_ Condition of all weather roads - entrance
19. \_\_\_\_\_ Condition of all-weather - internal haul roads

Run-on/Run-off Controls (258.26)

20. NA Condition of ditches/swales
21. NA Condition of berms/terraces/downchutes
22. \_\_\_\_\_ Condition of sedimentation ponds

Leachate Seeps (258.26 and 27)

23. \_\_\_\_\_ Leachate seep management

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24. NA Free of unauthorized bulk or non-containerized liquids

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43. Y/N NA NI Permitted stabilization/landscaping plan available
44. Y/N NA NI Permitted contingency plan available
45. Y/N NA NI Permitted approved groundwater-monitoring plan available
46. Y/N NA NI Permitted closure plan available
47. Y/N NA NI Permitted post-closure plan available

Name of those present during the inspection: Gary Foster

Comments:

Inspection Item	Corrective action required	Date to be completed
20. <u>NA</u> Condition of ditches/swales	12/21/2011 - 12/22/2011 - 12/23/2011 - 12/24/2011 - 12/25/2011 - 12/26/2011 - 12/27/2011 - 12/28/2011 - 12/29/2011 - 12/30/2011 - 12/31/2011	12/21/2011
21. <u>NA</u> Condition of berms/terraces/downchutes	12/21/2011 - 12/22/2011 - 12/23/2011 - 12/24/2011 - 12/25/2011 - 12/26/2011 - 12/27/2011 - 12/28/2011 - 12/29/2011 - 12/30/2011 - 12/31/2011	12/21/2011
22. _____ Condition of sedimentation ponds		
23. _____ Leachate seep management		
24. <u>NA</u> Free of unauthorized bulk or non-containerized liquids		
25. <u>Y/N</u> <u>NA</u> <u>NI</u> Required records are maintained in the landfill's operating record		

Additional comment page: Y/N

Photos taken: Y/N

The signature below certifies that the SCDHEC Inspector has personally checked each item and has answered according to the true condition existing at the time of inspection.

Facility Representative

SCDHEC Inspector



**Attachment 2**



Mr. Dale Stoudemire, Manager  
South Carolina Department of Health and Environmental Control  
Bureau of Water/Water Pollution Control Division  
Data Management Section  
2600 Bull Street  
Columbia, South Carolina 29201

ARCADIS  
6723 Towpath Road  
P.O. Box 66  
Syracuse  
New York 13214-0066  
Tel 315.446.9120  
Fax 315.449.0017  
[www.arcadis-us.com](http://www.arcadis-us.com)

#### ENVIRONMENTAL

Subject:  
Schlumberger Technology Corporation, Twelvemile Creek Restoration Project  
Pickens County, South Carolina  
October 2011 Sampling Results Report

Date:  
November 17, 2011

Dear Mr. Stoudemire:

Contact:  
Lance S. Ketcham

On behalf of Schlumberger Technology Corporation (STC), ARCADIS is providing a summary of sampling results for the Twelvemile Creek Restoration Project in Pickens County for the month of October 2011 in accordance with the October 15, 2009 letter from Butch Swygert of South Carolina Department of Health and Environmental Control (SCDHEC) to Chris Moody of ARCADIS, as revised in the August 16, 2011 letter from Jeffrey P. deBessonnet of SCDHEC, and the March 11, 2010 SCDHEC construction operation approval memorandum. The August 16, 2011 letter modified the monitoring requirements based on reduced flow through the water treatment plant following completion of hydraulic dredging. Modifications included removing chronic whole effluent toxicity (WET) testing and converting 24-hour composite samples to grab samples.

Phone:  
315.671.9163

Email:  
[lance.ketcham@arcadis-us.com](mailto:lance.ketcham@arcadis-us.com)

Our ref:  
MT001019

Table 1 contains the water treatment plant flow for the month of October. This data is recorded onsite and is reviewed by a South Carolina certified water treatment plant operator. The maximum daily discharge to Twelvemile Creek for October 2011 was 0.09 million gallons per day (MGD) on October 3. The average discharge to Twelvemile Creek from the water treatment plant for the month of October was 0.02 MGD. As of August 3, only two of the original six treatment trains remain active.

Table 2 contains the results of the analyses described in Table 1 of the October 15, 2009 letter that were performed on the water treatment plant effluent during the month of October 2011. All samples collected were grab samples as required by the August 16, 2011 letter. The Laboratory Services Reports from Rogers & Calcott Laboratory Services related to these tests are provided in Attachment A. The samples were analyzed for pH, temperature, total suspended solids and PCBs.

Imagine the result

**ARCADIS**

Mr. Dale Stoudemire  
November 17, 2011

Results were within the ranges outlined in the October 15, 2009 letter for the listed parameters.

Table 3 summarizes the results of the acute WET testing received from Rogers & Callcott Laboratory Services. The results from the October 2011 acute WET testing passed and the Laboratory Services Report is provided in Attachment B.

If you have any questions on the above, please feel free to contact me.

Sincerely,

ARCADIS



Lance S. Ketcham  
Principal Engineer

LSK/amm

Copies:

Melinda Vickers, SCDHEC  
Eric Kim, SCDHEC  
Du'Bois J. Ferguson, STC  
Gary Odom, STC  
J. Paul Doody, ARCADIS

**ARCADIS**

**Tables**

**Table 1. Daily Flow from Water Treatment Plant for October 2011. Twelvemile Creek Restoration Project, Pickens County**

Date	Flow, MGD
<b>Monthly Avg <sup>1</sup></b>	<b>MR</b>
<b>Daily Max <sup>1</sup></b>	<b>MR</b>
10/1/2011	0.03
10/2/2011	0
10/3/2011	<b>0.09</b>
10/4/2011	0.06
10/5/2011	0.04
10/6/2011	0.05
10/7/2011	0.04
10/8/2011	0
10/9/2011	0
10/10/2011	0
10/11/2011	0.02
10/12/2011	0.03
10/13/2011	0.04
10/14/2011	0.05
10/15/2011	0.02
10/16/2011	0.02
10/17/2011	0.03
10/18/2011	0.03
10/19/2011	0.02
10/20/2011	0.01
10/21/2011	0
10/22/2011	0.02
10/23/2011	0
10/24/2011	0.04
10/25/2011	0.02
10/26/2011	0.03
10/27/2011	0.02
10/28/2011	0.02
10/29/2011	0
10/30/2011	0
10/31/2011	0.01
Total Discharge to Twelvemile Creek	0.7
Days per Month	31
Average Discharge	0.02

**Notes:**

1. The flow rates shown are recorded by a South Carolina certified wastewater treatment plant operator in the water treatment plant flow log maintained onsite.  
A flow rate of 0 MGD is shown in this table when no flow is recorded in the flow log for that day.
2. On 7/24/2011, three of the six process trains (trains D, E, and F) were taken offline and the meters removed. On 8/3/11, train A was taken offline.
3. Bolded value is the maximum daily discharge recorded.

**Superscript Notes:**

<sup>1</sup> Discharge reporting guidelines are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS).

**Acronyms and Abbreviations:**

Avg - average  
Max - maximum  
MGD - million gallons per day  
MR - monitor and report



Table 2. Weekly Effluent Sampling Result for October 2011. Twelvemile Creek Restoration Project, Pickens County

Sample Number	Location	Sample Type	Week	Sample Date and Time	pH	Temp. (°C)	TSS (mg/L)	PCB (µg/L)						
								PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1264	PCB-1260
Monthly Avg.	—	—	—	—	6.0 to 8.5	—	25	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Daily Max.	—	—	—	—	6.0 to 8.5	—	45	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AD10915	WTP Effluent Discharge	G	1	10/4/2011 09:20	6.3	18.0	NA	NA	NA	NA	NA	NA	NA	NA
AD10916	WTP Effluent Discharge	G		10/4/2011 09:15	NA	NA	2.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
AD11458	WTP Effluent Discharge	G	2	10/11/2011 09:10	6.3	18.7	NA	NA	NA	NA	NA	NA	NA	NA
AD11459	WTP Effluent Discharge	G		10/11/2011 09:05	NA	NA	7.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
AD11903	WTP Effluent Discharge	G	3	10/18/2011 09:20	6.3	18.8	NA	NA	NA	NA	NA	NA	NA	NA
AD11904	WTP Effluent Discharge	G		10/18/2011 09:20	NA	NA	5.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
AD12378	WTP Effluent Discharge	G	4	10/25/2011 09:30	6.3	18.5	NA	NA	NA	NA	NA	NA	NA	NA
AD12379	WTP Effluent Discharge	G		10/25/2011 09:30	NA	NA	3.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Average					6.3	18.8	5.0	-	-	-	-	-	-	-

**Notes:**

1. Sampling results compiled from Laboratory Services Reports provided by Rogers & Callot Laboratory Services and submitted in tabular form as required per the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control (SCDHEC)) to Chris Moody (ARCADIS) and the 3/11/2010 SCDHEC construction and operational approval memorandum.
2. The monthly average includes non-detect readings as indicated by "<" (if applicable) and assumes a value equal to the detection limit. Monthly averages are not calculated for parameters without a detected concentration (indicated by "-").

**Superscript Note:**

<sup>1</sup> Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (SDHEC) to Chris Moody (ARCADIS)

**Acronyms and Abbreviations:**

°C - degrees centigrade  
G - grab sample  
µg/L - micrograms per liter  
mg/L - milligrams per liter  
NA - not analyzed  
PCB - polychlorinated biphenyl  
Temp. - temperature

**Table 3. Whole Effluent Toxicity Result for October 2011. Twelvemile Creek Restoration Project, Pickens County**

WET Analysis	Monthly Average <sup>1</sup>	Daily Maximum <sup>1</sup>	Results
<i>Ceriodaphnia dubia</i> Acute WET @ ATC=35.5%	--	0 <sup>2</sup>	0

**Notes:**

1. A grab sample (AD10818) for acute WET testing was collected on 10/4/2011 as required by the 8/16/2011 letter.

**Superscript Notes:**

<sup>1</sup> Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS) as revised in the 8/16/2011 letter.

<sup>2</sup> A results of "0" indicates a passing result.

**Acronyms and Abbreviations:**

WET - whole effluent toxicity

**ARCADIS**

**Attachments**

**ARCADIS**

**Attachment A**

**Laboratory Services Report:  
October 15, 2009 Table 1  
Analyses**



**ROGERS & CALLCOTT  
LABORATORY SERVICES**

**AN EMPLOYEE-OWNED COMPANY**

P.O. Box 5655, Greenville, SC 29606

Phone: (864) 232-1556 - FAX: (864) 232-6140

***Laboratory Services Report***

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Gary Odom by email

**Date Received:** 10/04/2011

**Time Received:** 13:08

**Date Reported:** 10/06/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

***Sample Number***

***Sample Description***



AD10915

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 10/04/2011 at 09:20



AD10916

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 10/04/2011 at 09:15

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

**Results released by:**

authorized signature

**Results reviewed by:**

**Carbon copy: Email to Schlumberger TMC Group**

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<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD10915	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/04/2011 at 09:20						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.3	pH units		0.1	10/04/2011 09:20	LRW	SM 4500HB
Temperature (Field)	18.0	degrees C		0.1	10/04/2011 09:20	LRW	SM 2550B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD10916	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/04/2011 at 09:15						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around	Completed				10/06/2011 00:00		
Total Suspended Solids	2.8	mg/l		2.0	10/04/2011 13:45	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	10/05/2011 16:39	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	10/05/2011 16:39	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	10/05/2011 16:39	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	10/05/2011 16:39	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	10/05/2011 16:39	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	10/05/2011 16:39	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	10/05/2011 16:39	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	104	%		0	10/05/2011 16:39	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	96	%		0	10/05/2011 16:39	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				10/04/2011 14:00	DBB	EPA 608



**ROGERS & CALLCOTT**  
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606  
Phone (864) 232-1556 Fax (864) 232-6140  
Shipping Address: 426 Fairforest Way  
Greenville, SC 29607

Client Name Sc H Lumber Co

**Address** \_\_\_\_\_

Report To: \_\_\_\_\_

Telephone No. \_\_\_\_\_ FAX No. \_\_\_\_\_

PO No. \_\_\_\_\_ Project No. \_\_\_\_\_

## CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

		N	N							Filtered (Yes/No)
		Y	Y							Cooled (Yes/No)
		P	G							Container Type (E/G)
		ECD								Container Volume
		G	G							Sample Type (Grab/Composite)
		WW/WW								Sample Source (WW, GW, DW, Other)
Total Number of Containers		N	N							Sample Source Chlorinated (Yes/No)
		NA	NEG.							Lab Receipt Cl Check <i>mca</i>
		NA	7							Lab Receipt pH Check <i>10-6-11</i>
		A	A							Preserved (Code)
	PARAMETERS	TSS	PCB							A=None      D=NaOH      G-Boric Acid B-HNO <sub>3</sub> E-HCL       H-Ascorbic Acid C-H <sub>2</sub> SO <sub>4</sub> F=Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub> I=_____
										COMMENTS:
	2	1	1+N							<i>AD10915</i> <i>pH 6.3 GRAB TAKEN</i> <i>Temp 18.0°C + READ @</i> <i>0920 ON 10/4/11</i> <i>By Rtc</i>
3.)	Slag	Date/Time	10/4/11	1308	KNOWN HAZARDS ASSOCIATED WITH SAMPLES					
3.)		Date/Time								
3.)		Date/Time								
at'chd by		Recvd. Intact by			Temperature of blank or representative sample					
					At time of collection _____ °C					
					At time of lab receipt <i>6.4</i> °C					



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Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

***Laboratory Services Report***

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Vic Cocianni

**Date Received:** 10/11/2011

**Time Received:** 11:59

**Date Reported:** 10/13/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

***Sample Number***

***Sample Description***



AD11458

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 10/11/2011 at 09:10



AD11459

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 10/11/2011 at 09:05

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

**Results released by:**

*Amey J Amley*  
authorized signature

**Results reviewed by:**

*JS*

**Carbon copy: Email to L Ketcham S Handley A Kohler S Cary**

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<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD11458	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/11/2011 at 09:10						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.3	pH units		0.1	10/11/2011 09:10	LRW	SM 4500HB
Temperature (Field)	18.7	degrees C		0.1	10/11/2011 09:10	LRW	SM 2650B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD11459	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/11/2011 at 09:05						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around	Completed				10/13/2011 00:00		
Total Suspended Solids	7.8	mg/l		2.0	10/11/2011 15:00	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	10/13/2011 00:00	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	10/13/2011 00:00	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	10/13/2011 00:00	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	10/13/2011 00:00	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	10/13/2011 00:00	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	10/13/2011 00:00	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	10/13/2011 00:00	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	95	%		0	10/13/2011 00:00	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	75	%		0	10/13/2011 00:00	RKH	EPA 608
Liquid-Liquid Extraction Pest/PCB 608	Completed				10/12/2011 08:00	CGW	EPA 608





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***Laboratory Services Report***

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 10/18/2011

**Time Received:** 12:20

**Date Reported:** 10/20/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

***Sample Number***

***Sample Description***



AD11903 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 10/18/2011 at 09:20



AD11904 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 10/18/2011 at 09:20

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

**Results released by:**

*Mary F. Ashley*  
authorized signature

**Results reviewed by:**

*SS*

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<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD11903	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/18/2011 at 09:20						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.3	pH units		0.1	10/18/2011 09:20	LRW	SM 4500HB
Temperature (Field)	19.8	degrees C		0.1	10/18/2011 09:20	LRW	SM 2550B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD11904	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/18/2011 at 09:20						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around.	Completed				10/20/2011 00:00		
Total Suspended Solids	5.8	mg/l		2.0	10/18/2011 14:25	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	10/20/2011 04:43	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	10/20/2011 04:43	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	10/20/2011 04:43	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	10/20/2011 04:43	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	10/20/2011 04:43	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	10/20/2011 04:43	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	10/20/2011 04:43	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	90	%		0	10/20/2011 04:43	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	88	%		0	10/20/2011 04:43	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				10/18/2011 13:30	DBB	EPA 608





P.O. Box 5655, Greenville, SC 29606  
Phone: (864) 232-1556 Fax: (864) 232-8140  
Shipping Address: 426 Fairforest Way  
Greenville, SC 29607

**Address** \_\_\_\_\_

Report To: \_\_\_\_\_

Telephone No. \_\_\_\_\_ FAX No. \_\_\_\_\_

PO No. \_\_\_\_\_ Project No. \_\_\_\_\_

PAGE 1 OF 1

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**Laboratory Services Report**

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 10/25/2011



**Time Received:** 12:15

**Date Reported:** 10/27/2011

*South Carolina Laboratory Identification 23105*

*North Carolina Laboratory Certificate Number 27*

*NELAP Laboratory Identification E87822*

	<i>Sample Number</i>	<i>Sample Description</i>
	AD12378	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/25/2011 at 09:30
	AD12379	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/25/2011 at 09:30

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

**Results released by:**

Rebecca F. Musick  
authorized signature

**Results reviewed by:**

SK

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## EXPLANATION OF REPORT SYMBOLS AND ABBREVIATIONS

The following defines common symbols and abbreviations used in reporting technical data:

<	Less than
>	Greater than
mg/L, mg/kg	Units of concentration in milligrams per liter for liquids, and milligrams per kilogram for solids. Also referred to as parts per million.
µg/L, µg/kg	Units of concentration in micrograms per liter for liquids, and micrograms per kilogram for solids. Also referred to as parts per billion.
RDL	Reported detection limit
CFU	Colony forming unit
TNTC	Too numerous to count
MSL	Mean sea level
NTU	Nephelometric turbidity units
µmhos/cm	Units of specific conductance expressed in micromhos per centimeter
°C, °F	Units of temperature expressed in degrees Celsius or degrees Fahrenheit.
mgd, gpd	Measure of flow in million gallons per day (mgd) or gallons per day (gpd).
Surrogate	Compound added by the laboratory for quality control monitoring.
<b>Data Qualifiers:</b>	
J	Estimated value
Q	Laboratory specific qualifier - refer to case narrative or client notification form.
K	The sample was analyzed beyond the accepted holding time.
B	Analyte was also detected in the method blank.
X	Result subject to sample matrix interference. Reported detection limit has been adjusted where applicable.
Z	Defined in comments. If there are multiple comments, the "Z" may be followed by a number designation.
E	Estimated value - the analyte was detected at concentrations greater than the calibration range.
E1	Estimated value - falls below countable plate range.
S	The matrix spike and / or matrix spike duplicate sample recovery was not within control limits.
S1	The matrix spike and / or matrix spike duplicate sample recovery was not within control limits due to matrix interference.
P	The RPD between the sample / duplicate or matrix spike / spike duplicate was not within quality control limits.
P1	The RPD between the sample / duplicate or matrix spike / spike duplicate was not within quality control limits due to sample matrix interference.
R	The surrogate was not within quality control limits.
R1	The surrogate was not within quality control limits due to matrix interference.
L	The analyte in the LCS was not within control limits.
D	Due to a discrepancy between the BOD and COD results, the BOD has been reported as less than the COD value.
A	Reporting limit has been adjusted due to limited sample volume.

**LIMITATION OF LIABILITY** - The accuracy of all analytical results is for the sample as is received by the laboratory. The integrity of the sample begins at the time it is placed in the possession of authorized Rogers and Callcott Engineers, Inc. Laboratory personnel. All warranties, expressed, or implied, are disclaimed. Liability is limited to the cost of the analyses.

**SAMPLE RETURN POLICY** - Rogers and Callcott Engineers, Inc. reserves the right to charge a sample disposal fee or to return samples to the client.

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD12378	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/25/2011 at 09:30						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.3	pH units		0.1	10/25/2011 09:30	LRW	SM 4500HB
Temperature (Field)	18.5	degrees C		0.1	10/25/2011 09:30	LRW	SM 2550B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD12379	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/25/2011 at 09:30						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around	Completed				10/27/2011 00:00		
Total Suspended Solids	3.6	mg/l		2.0	10/25/2011 14:20	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	10/26/2011 22:49	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	10/26/2011 22:49	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	10/26/2011 22:49	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	10/26/2011 22:49	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	10/26/2011 22:49	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	10/26/2011 22:49	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	10/26/2011 22:49	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	92	%		0	10/26/2011 22:49	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	84	%		0	10/26/2011 22:49	RKH	EPA 608
Liquid-Liquid Extraction Pest/PCB 608	Completed				10/25/2011 12:45	CGW	EPA 608



**ARCADIS**

**Attachment B**

**Laboratory Services Report:  
Whole Effluent Toxicity Testing**





**ROGERS & CALLCOTT**  
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AN EMPLOYEE-OWNED COMPANY

P.O. Box 5655, Greenville, SC 29606

Phone: (864) 232-1556 - FAX: (864) 232-6140

**Laboratory Services Report**

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Vic Cocianni

**Date Received:** 10/04/2011

**Time Received:** 13:31

**Date Reported:** 10/14/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

**Sample Number**

**Sample Description**



AD10818 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 10/04/2011 at 09:15

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

**Results released by:**

Rebecca F. Musick  
authorized signature

**Results reviewed by:**

aza

**Carbon copy: Email to L Ketcham S Handley A Kohler S Cary**

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**Sample Number****Sample Description, Date and Time Collected**

AD10818

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 10/04/2011 at 09:15

**Parameter****Result****Unit****Flag****RDL****Date/Time****Analyst****Method**

Subcontracted Sample Analysis

Completed

10/14/2011 00:00

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 4 pages for Acute Toxicity from ETT Environmental Inc.



(864) 877-6942 . FAX (864) 877-6938

P.O. Box 16414, Greenville, SC 29606

Craftsman Court, Greer, SC 29650

## **Ceriodaphnia dubia 48 Hour Acute Pass/Fail Test**

**EPA-821-R-02-012 Method 2002**

**Facility: Schlumberger / 12 Mile Creek  
Sample ID: Effluent**

**Test Date: October 4, 2011**

**ETT Laboratory ID# T38598  
Rogers and Callcott Laboratory ID# AD10818**

**Test Reviewed and Approved By:**

Robert W. Kelley, Ph.D. Laboratory Manager

**nelac** Certification #E87819 (FL)

Test results presented in this report conform to all requirements of  
NELAC, conducted under NELAC Certification Number E87819  
Florida Dept. of Health. Included results pertain only to provided samples.

**SCDHEC Certification #23104**

**NCDENR Certification #022**

**DMR Attachment for Toxicity Test Results. Bureau of Water**

**SCHLUMBERGER**

Permit number **SC**

Discharge #:

Final Limits:

Parameter Code **TGA3B** MLOC=1

%Effluent

Monitoring Period							
From	Year	Month	Day	To	Year	Month	Day
	11	10	1		11	10	31

Date	04-Oct-11	Group	All tests			Chronic Tests Only		
			#Adults	#Dead	Pass/Fail	Average	Variance	Pass/Fail
Lab ID	23104	Control	20	0	PASS			
		Test	20	0				

Date		Group	All tests			Chronic Tests Only		
			#Adults	#Dead	Pass/Fail	Average	Variance	Pass/Fail
Lab ID		Control						
		Test						

Date		Group	All tests			Chronic Tests Only		
			#Adults	#Dead	Pass/Fail	Average	Variance	Pass/Fail
Lab ID		Control						
		Test						

Date		Group	All tests			Chronic Tests Only		
			#Adults	#Dead	Pass/Fail	Average	Variance	Pass/Fail
Lab ID		Control						
		Test						

Date		Group	All tests			Chronic Tests Only		
			#Adults	#Dead	Pass/Fail	Average	Variance	Pass/Fail
Lab ID		Control						
		Test						

Date		Group	All tests			Chronic Tests Only		
			#Adults	#Dead	Pass/Fail	Average	Variance	Pass/Fail
Lab ID		Control						
		Test						

Signature of Principal Executive Officer or Authorized Agent \_\_\_\_\_

Name/Title of Principal Executive Officer (typed or printed) \_\_\_\_\_

## STATISTICAL ANALYSIS RESULTS

Facility:	SCHLUMBERGER	NPDES#	SC
Sample ID:	EFFLUENT	ETT#	T38598
		Date:	04-Oct-11
Laboratory:	ETT Environmental, Inc.	Certification #:	23104
		Exp. Date:	10/4/2011

<b>Survival Data</b>			
	48 Hra. Survival	Test Used:	Fisher's Test
Control	100%	Test Statistic:	P= 1.000
Effluent	100%	Critical Value:	P= 0.05
<b>PASS: The effluent does not reduce survival of the test organisms.</b>			





Infrastructure · Water · Environment · Buildings

Mr. Dale Stoudemire, Manager  
South Carolina Department of Health and Environmental Control  
Bureau of Water/Water Pollution Control Division  
Data Management Section  
2600 Bull Street  
Columbia, South Carolina 29201

**Subject:**

Schlumberger Technology Corporation, Twelvemile Creek Restoration Project  
Pickens County, South Carolina  
November 2011 Sampling Results Report

Dear Mr. Stoudemire:

On behalf of Schlumberger Technology Corporation (STC), ARCADIS is providing a summary of sampling results for the Twelvemile Creek Restoration Project in Pickens County for the month of November 2011 in accordance with the October 15, 2009 letter from Butch Swygert of South Carolina Department of Health and Environmental Control (SCDHEC) to Chris Moody of ARCADIS, as revised in the August 16, 2011 letter from Jeffrey P. deBessonnet of SCDHEC, and the March 11, 2010 SCDHEC construction operation approval memorandum. The August 16, 2011 letter modified the monitoring requirements based on reduced flow through the water treatment plant following completion of hydraulic dredging. Modifications included removing chronic whole effluent toxicity (WET) testing and converting 24-hour composite samples to grab samples.

Table 1 contains the water treatment plant flow for the month of November. This data is recorded onsite and is reviewed by a South Carolina certified water treatment plant operator. The maximum daily discharge to Twelvemile Creek for November 2011 was 34,100 gallons per day on November 29. The average discharge to Twelvemile Creek from the water treatment plant for the month of November was approximately 14,000 gallons per day. As of November 15, one of the six original treatment process trains remains in use for water treatment.

Table 2 contains the results of the analyses described in Table 1 of the October 15, 2009 letter that were performed on the water treatment plant effluent during the month of November 2011. All samples collected were grab samples as required by the August 16, 2011 letter. The Laboratory Services Reports from Rogers & Callcott Laboratory Services related to these tests are provided in Attachment A. The samples were analyzed for pH, temperature, total suspended solids and PCBs.

Imagine the result

G:\Clients\Schlumberger\Twelvemile Creek Restoration\12 Dredge Construction Phase\Water Treatment Monitoring\Monthly Reports\2011-11\Final\4281111214\_Sampling Results Report\_2011\_November\_Final.doc

ARCADIS  
6723 Towpath Road  
P.O. Box 66  
Syracuse  
New York 13214-0066  
Tel 315.446.9120  
Fax 315.449.0017  
[www.arcadis-us.com](http://www.arcadis-us.com)

ENVIRONMENTAL

Date:  
December 21, 2011

Contact:  
Lance S. Ketcham

Phone:  
315.671.9163

Email:  
[lance.ketcham@arcadis-us.com](mailto:lance.ketcham@arcadis-us.com)

Our ref:  
MT001019

**ARCADIS**

Mr. Dale Stoudemire  
December 21, 2011

Results were within the ranges outlined in the October 15, 2009 letter for the listed parameters.

Table 3 summarizes the results of the acute WET testing received from Rogers & Callcott Laboratory Services. The results from the November 2011 acute WET testing passed and the Laboratory Services Report is provided in Attachment B.

If you have any questions on the above, please feel free to contact me.

Sincerely,

ARCADIS



Lance S. Ketcham  
Principal Engineer

LSK/amm

Copies:

Melinda Vickers, SCDHEC  
Eric Kim, SCDHEC  
Du'Bois J. Ferguson, STC  
Gary Odom, STC  
J. Paul Doody, ARCADIS



**ARCADIS**

**Tables**

**Table 1. Daily Flow from Water Treatment Plant for November 2011. Twelvemile Creek Restoration Project, Pickens County**

Date	Flow, gal/day
<b>Monthly Avg <sup>1</sup></b>	<b>MR</b>
<b>Daily Max <sup>1</sup></b>	<b>MR</b>
11/1/2011	27,800
11/2/2011	19,800
11/3/2011	22,300
11/4/2011	14,200
11/5/2011	0
11/6/2011	0
11/7/2011	8,400
11/8/2011	25,400
11/9/2011	20,000
11/10/2011	5,100
11/11/2011	22,300
11/12/2011	0
11/13/2011	0
11/14/2011	7,700
11/15/2011	12,100
11/16/2011	13,800
11/17/2011	18,300
11/18/2011	26,200
11/19/2011	23,200
11/20/2011	20,300
11/21/2011	6,200
11/22/2011	15,600
11/23/2011	13,400
11/24/2011	0
11/25/2011	0
11/26/2011	0
11/27/2011	0
11/28/2011	28,200
11/29/2011	34,100
11/30/2011	29,400
Total Discharge to Twelvemile Creek	413,800
Days per Month	30
Average Discharge (approximate)	13,800

**Notes:**

- The flow rates shown are recorded by a South Carolina certified wastewater treatment plant operator in the water treatment plant flow log maintained onsite. A flow rate of 0 gal/day is shown in this table when no flow is recorded in the flow log for that day.
- On 7/24/2011, three of the six process trains (trains D, E, and F) were taken offline and the meters removed. On 8/3/11, train A was taken offline. On 11/15/11, train B was taken offline.
- Bolded value is the maximum daily discharge recorded.

**Superscript Notes:**

<sup>1</sup> Discharge reporting guidelines are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS).

**Acronyms and Abbreviations:**

Avg - average  
gal/day - gallons per day  
Max - maximum  
MR - monitor and report

Table 2. Weekly Effluent Sampling Result for November 2011. Twelvemile Creek Restoration Project, Pickens County

Sample Number	Location	Sample Type	Week	Sample Date and Time	pH	Temp. (°C)	TSS (mg/L)	PCB (µg/L)						
								PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
Monthly Avg.	—	—	—	—	6.0 to 8.5	—	25	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Daily Max.	—	—	—	—	6.0 to 8.5	—	45	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AD12775	WTP Effluent Discharge	G	1	11/1/2011 09:10	6.3	16.3	NA	NA	NA	NA	NA	NA	NA	NA
AD12776	WTP Effluent Discharge	G		11/1/2011 09:10	NA	NA	4.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AD13315	WTP Effluent Discharge	G	2	11/8/2011 09:15	6.3	17.7	NA	NA	NA	NA	NA	NA	NA	NA
AD13316	WTP Effluent Discharge	G		11/8/2011 09:15	NA	NA	5.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AD13940	WTP Effluent Discharge	G	3	11/15/2011 09:15	6.2	18.9	NA	NA	NA	NA	NA	NA	NA	NA
AD13941	WTP Effluent Discharge	G		11/15/2011 09:15	NA	NA	5.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AD14459	WTP Effluent Discharge	G	4	11/22/2011 08:55	6.2	18.6	NA	NA	NA	NA	NA	NA	NA	NA
AD14460	WTP Effluent Discharge	G		11/22/2011 08:55	NA	NA	5.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AD14723	WTP Effluent Discharge	G	5	11/29/2011 09:10	6.2	16.1	NA	NA	NA	NA	NA	NA	NA	NA
AD14724	WTP Effluent Discharge	G		11/29/2011 09:10	NA	NA	3.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average					6.2	17.5	5.0	-	-	-	-	-	-	-

**Notes:**

1. Sampling results compiled from Laboratory Services Reports provided by Rogers & Calicut Laboratory Services and submitted in tabular form as required per the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control (SCDHEC)) to Chris Moody (ARCADIS) and the 3/11/2010 SCDHEC construction and operational approval memorandum.
2. The monthly average includes non-detect readings as indicated by "<" (if applicable) and assumes a value equal to the detection limit. Monthly averages are not calculated for parameters without a detected concentration (indicated by "—").

**Superscript Note:**

<sup>1</sup> Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (SDHEC) to Chris Moody (ARCADIS)

**Acronyms and Abbreviations:**

°C - degrees centigrade  
G - grab sample  
µg/L - micrograms per liter  
mg/L - milligrams per liter  
NA - not analyzed  
PCB - polychlorinated biphenyl  
Temp. - temperature

**Table 3. Whole Effluent Toxicity Result for November 2011. Twelvemile Creek Restoration Project, Pickens County**

WET Analysis	Monthly Average <sup>1</sup>	Daily Maximum <sup>1</sup>	Results
<i>Ceriodaphnia dubia</i> Acute WET @ ATC=35.5%	--	0 <sup>2</sup>	0

**Notes:**

1. A grab sample (AD12743) for acute WET testing was collected on 11/01/2011 as required by the 8/16/2011 letter.

**Superscript Notes:**

<sup>1</sup> Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS) as revised in the 8/16/2011 letter.

<sup>2</sup> A results of "0" indicates a passing result.

**Acronyms and Abbreviations:**

WET -- whole effluent toxicity

**ARCADIS**

**Attachments**

**ARCADIS**

**Attachment A**

**Laboratory Services Report:  
October 15, 2009 Table 1  
Analyses**



**ROGERS & CALLCOTT**  
LABORATORY SERVICES

AN EMPLOYEE-OWNED COMPANY

P.O. Box 5655, Greenville, SC 29606

Phone: (864) 232-1556 - FAX: (864) 232-6140

***Laboratory Services Report***

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 11/01/2011

**Time Received:** 12:19

**Date Reported:** 11/04/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

***Sample Number***

***Sample Description***



AD12775 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 11/01/2011 at 09:10



AD12776 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 11/01/2011 at 09:10

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

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**Results reviewed by:**

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<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD12775	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/01/2011 at 09:10						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.3	pH units		0.1	11/01/2011 09:10	LRW	SM 4500HB
Temperature (Field)	16.3	degrees C		0.1	11/01/2011 09:10	LRW	SM 2550B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD12776	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/01/2011 at 09:10						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around	Completed				11/04/2011 00:00		
Total Suspended Solids	4.4	mg/l		2.0	11/01/2011 15:15	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	11/03/2011 01:01	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	11/03/2011 01:01	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	11/03/2011 01:01	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	11/03/2011 01:01	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	11/03/2011 01:01	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	11/03/2011 01:01	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	11/03/2011 01:01	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	93	%		0	11/03/2011 01:01	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	79	%		0	11/03/2011 01:01	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				11/01/2011 13:00	CGW	EPA 608





## CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name Schlumberger

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Telephone No. \_\_\_\_\_ FAX No. \_\_\_\_\_

PO No. \_\_\_\_\_ Project No. \_\_\_\_\_

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**Laboratory Services Report**

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 11/08/2011

**Time Received:** 12:14

**Date Reported:** 11/11/2011

*South Carolina Laboratory Identification 23105*

*North Carolina Laboratory Certificate Number 27*

*NELAP Laboratory Identification E87822*

**Sample Number**

**Sample Description**



AD13315

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 11/08/2011 at 09:15



AD13316

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 11/08/2011 at 09:15

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*Blanca M. Musick*  
authorized signature

**Results reviewed by:**

*SSG*

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<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD13315	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/08/2011 at 09:15						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.3	pH units		0.1	11/08/2011 09:15	LRW	SM 4500HB
Temperature (Field)	17.7	degrees C		0.1	11/08/2011 09:15	LRW	SM 2550B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD13316	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/08/2011 at 09:15						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around	Completed				11/11/2011 00:00		
Total Suspended Solids	5.6	mg/l		2.0	11/08/2011 17:20	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	11/10/2011 18:21	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	11/10/2011 18:21	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	11/10/2011 18:21	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	11/10/2011 18:21	RKH	EPA 608
PCB-1248	< RDL	ug/l	P	0.5	11/10/2011 18:21	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	11/10/2011 18:21	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	11/10/2011 18:21	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	98	%		0	11/10/2011 18:21	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	89	%		0	11/10/2011 18:21	RKH	EPA 608

Analysis comment for Polychlorinated Biphenyls (PCBs): P - The RPD result for AD13316 exceeded quality control limits; however, both percent recoveries were within acceptable quality control limits.

Liquid-liquid Extraction Pest/PCB 608	Completed				11/08/2011 13:40	CGW	EPA 608
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**Laboratory Services Report**

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 11/15/2011



**Time Received:** 12:28

**Date Reported:** 11/17/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

	<b>Sample Number</b>	<b>Sample Description</b>
	AD13940	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/15/2011 at 09:15
	AD13941	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/15/2011 at 09:15

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Ammy J Ashley  
authorized signature

**Results reviewed by:**

JS

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<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD13940	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/15/2011 at 09:15						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.2	pH units		0.1	11/15/2011 09:15	LRW	SM 4500HB
Temperature (Field)	18.9	degrees C		0.1	11/15/2011 09:15	LRW	SM 2550B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD13941	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/15/2011 at 09:15						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around	Completed				11/17/2011 00:00		
Total Suspended Solids	5.6	mg/l		2.0	11/15/2011 14:50	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	11/16/2011 23:07	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	11/16/2011 23:07	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	11/16/2011 23:07	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	11/16/2011 23:07	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	11/16/2011 23:07	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	11/16/2011 23:07	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	11/16/2011 23:07	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	95	%		0	11/16/2011 23:07	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	91	%		0	11/16/2011 23:07	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				11/15/2011 14:00	CGW	EPA 608



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PAGE 1 OF 1

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***Laboratory Services Report***

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 11/22/2011



**Time Received:** 12:10

**Date Reported:** 11/28/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

	<b>Sample Number</b>	<b>Sample Description</b>
	AD14459	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/22/2011 at 08:55
	AD14460	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/22/2011 at 08:55

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

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authorized signature

**Results reviewed by:**



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## EXPLANATION OF REPORT SYMBOLS AND ABBREVIATIONS

The following defines common symbols and abbreviations used in reporting technical data:

<	Less than
>	Greater than
mg/L, mg/kg	Units of concentration in milligrams per liter for liquids, and milligrams per kilogram for solids. Also referred to as parts per million.
µg/L, µg/kg	Units of concentration in micrograms per liter for liquids, and micrograms per kilogram for solids. Also referred to as parts per billion.
RDL	Reported detection limit.
CFU	Colony forming unit
TNTC	Too numerous to count
MSL	Mean sea level
NTU	Nephelometric turbidity units
µmhos/cm	Units of specific conductance expressed in micromhos per centimeter
°C, °F	Units of temperature expressed in degrees Celsius or degrees Fahrenheit.
mgd, gpd	Measure of flow in million gallons per day (mgd) or gallons per day (gpd).
Surrogate	Compound added by the laboratory for quality control monitoring.

### Data Qualifiers:

J	Estimated value
Q	Laboratory specific qualifier - refer to case narrative or client notification form.
K	The sample was analyzed beyond the accepted holding time.
B	Analyte was also detected in the method blank.
X	Result subject to sample matrix interference. Reported detection limit has been adjusted where applicable.
Z	Defined in comments. If there are multiple comments, the "Z" may be followed by a number designation.
E	Estimated value - the analyte was detected at concentrations greater than the calibration range.
E1	Estimated value - falls below countable plate range.
S	The matrix spike and / or matrix spike duplicate sample recovery was not within control limits.
S1	The matrix spike and / or matrix spike duplicate sample recovery was not within control limits due to matrix interference.
P	The RPD between the sample / duplicate or matrix spike / spike duplicate was not within quality control limits.
P1	The RPD between the sample / duplicate or matrix spike / spike duplicate was not within quality control limits due to sample matrix interference.
R	The surrogate was not within quality control limits.
R1	The surrogate was not within quality control limits due to matrix interference.
L	The analyte in the LCS was not within control limits.
D	Due to a discrepancy between the BOD and COD results, the BOD has been reported as less than the COD value.
A	Reporting limit has been adjusted due to limited sample volume.

**LIMITATION OF LIABILITY** - The accuracy of all analytical results is for the sample as is received by the laboratory. The integrity of the sample begins at the time it is placed in the possession of authorized Rogers and Callcott Engineers, Inc. laboratory personnel. All warranties, expressed, or implied, are disclaimed. Liability is limited to the cost of the analyses.

**SAMPLE RETURN POLICY** - Rogers and Callcott Engineers, Inc. reserves the right to charge a sample disposal fee or to return samples to the client.

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD14459	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/22/2011 at 08:55						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
pH (Field)	6.2	pH units		0.1	11/22/2011 08:55	LRW	SM 4500HB
Temperature (Field)	18.6	degrees C		0.1	11/22/2011 08:55	LRW	SM 2550B

<u>Sample Number</u>	<u>Sample Description, Date and Time Collected</u>						
AD14460	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/22/2011 at 08:55						
<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>RDL</u>	<u>Date/Time</u>	<u>Analyst</u>	<u>Method</u>
3 to 5 day turn around	Completed				11/28/2011 00:00		
Total Suspended Solids	5.4	mg/l		2.0	11/22/2011 15:35	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	11/24/2011 09:53	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	11/24/2011 09:53	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	11/24/2011 09:53	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	11/24/2011 09:53	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	11/24/2011 09:53	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	11/24/2011 09:53	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	11/24/2011 09:53	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	79	%		0	11/24/2011 09:53	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	86	%		0	11/24/2011 09:53	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				11/22/2011 13:00	CGW	EPA 608





**ROGERS & CALLCOTT**  
LABORATORY SERVICES

AN EMPLOYEE-OWNED COMPANY

P.O. Box 5655, Greenville, SC 29606

Phone: (864) 232-1556 - FAX: (864) 232-6140

***Laboratory Services Report***

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 11/29/2011



**Time Received:** 12:12

**Date Reported:** 12/01/2011

**South Carolina Laboratory Identification 23105**

**North Carolina Laboratory Certificate Number 27**

**NELAP Laboratory Identification E87822**

	<b>Sample Number</b>	<b>Sample Description</b>
	AD14723	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/29/2011 at 09:10
	AD14724	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/29/2011 at 09:10

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

**Results released by:**

*Rebecca F. Musick*  
authorized signature

**Results reviewed by:**

*SS*

**Carbon copy: Email to L Ketcham S Handley A Kohler S Cary**

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**Sample Number****Sample Description, Date and Time Collected**

AD14723

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/29/2011 at 09:10

<b><u>Parameter</u></b>	<b><u>Result</u></b>	<b><u>Unit</u></b>	<b><u>Flag</u></b>	<b><u>RDL</u></b>	<b><u>Date/Time</u></b>	<b><u>Analyst</u></b>	<b><u>Method</u></b>
pH (Field)	6.2	pH units		0.1	11/29/2011 09:10	LRW	SM 4500HB
Temperature (Field)	16.1	degrees C		0.1	11/29/2011 09:10	LRW	SM 2550B

**Sample Number****Sample Description, Date and Time Collected**

AD14724

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/29/2011 at 09:10

<b><u>Parameter</u></b>	<b><u>Result</u></b>	<b><u>Unit</u></b>	<b><u>Flag</u></b>	<b><u>RDL</u></b>	<b><u>Date/Time</u></b>	<b><u>Analyst</u></b>	<b><u>Method</u></b>
3 to 5 day turn around	Completed				12/01/2011 00:00		
Total Suspended Solids	3.8	mg/l		2.0	11/29/2011 13:35	JLA	SM 2540D
<b>Polychlorinated Biphenyls (PCBs)</b>							
PCB-1016	< RDL	ug/l		0.5	11/30/2011 21:30	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	11/30/2011 21:30	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	11/30/2011 21:30	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	11/30/2011 21:30	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	11/30/2011 21:30	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	11/30/2011 21:30	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	11/30/2011 21:30	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate)	95	%		0	11/30/2011 21:30	RKH	EPA 608
Decachlorobiphenyl, (Surrogate)	90	%		0	11/30/2011 21:30	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				11/29/2011 14:15	CGW	EPA 608



P.O. Box 5655, Greenville, SC 29606  
Phone (864) 232-1556 Fax (864) 232-6140  
Shipping Address: 426 Fairforest Way  
Greenville, SC 29607

## CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name Schlumberger

**Address** \_\_\_\_\_

Report To: \_\_\_\_\_

Telephone No. \_\_\_\_\_ FAX No. \_\_\_\_\_

PO No. \_\_\_\_\_ Project No. \_\_\_\_\_

Rogers & Colcott Lab No.		Yr. <u>11</u> Date	Time	Sample Description	Total Number of C	PARAMETERS		Preserved (Code)		COMMENTS	
								A-None B-HNO <sub>3</sub> C-H <sub>2</sub> SO <sub>4</sub>	D-NaOH E-HCL F-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>		G-Boric Acid H-Ascorbic Acid I- _____
AD 14724	11/29	0910		WATER TREATMENT PLANT EFF. Disch.	2						AD14723 PH 6.2 GRAB TAKEN + TEMP 16.12 READ @ 0910 ON 11/29/11 BY RHC
SAMPLER Relinquished by (Sig.) ① <i>[Signature]</i>		Date/Time 11/29/11 12/12	Received by (Sig.) ② <i>[Signature]</i>		Date/Time 11/29/11 12/12	KNOWN HAZARDS ASSOCIATED WITH SAMPLES					
Relinquished by (Sig.) ③		Date/Time	Received by (Sig.) ④		Date/Time						
Relinquished by (Sig.) ⑤		Date/Time	Received by (Sig.) ⑥		Date/Time						
Seal # at'chd by <input type="radio"/> Recvd. Intact by <input type="radio"/> Seal # at'chd by <input type="radio"/> Recvd. Intact by <input type="radio"/>						Temperature of blank or representative sample At time of collection _____ °C At time of lab receipt <u>7.7</u> °C					

**ARCADIS**

**Attachment B**

**Laboratory Services Report:  
Whole Effluent Toxicity Testing**



**ROGERS & CALLCOTT**  
**LABORATORY SERVICES**

AN EMPLOYEE-OWNED COMPANY

P.O. Box 5655, Greenville, SC 29606

Phone: (864) 232-1556 - FAX: (864) 232-6140

***Laboratory Services Report***

**Client:** Schlumberger Technology Corporation  
Sangamo - Twelve Mile Creek Project  
Attention Virgilio Cocianni by email

**Date Received:** 11/01/2011

**Time Received:** 13:35

**Date Reported:** 11/14/2011

*South Carolina Laboratory Identification 23105*

*North Carolina Laboratory Certificate Number 27*

*NELAP Laboratory Identification E87822*

***Sample Number***

***Sample Description***



AD12743

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab,  
collected on 11/01/2011 at 09:50

*The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.*

*We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.*

**Results released by:**

*Anne Davis*  
authorized signature

**Results reviewed by:**

*SK*

**Carbon copy:** Email to L Ketcham S Handley A Kohler S Cary

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**Sample Number****Sample Description, Date and Time Collected**

AD12743

Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 11/01/2011 at 09:50

**Parameter****Result****Unit****Flag****RDL****Date/Time****Analyst****Method**

Subcontracted Sample Analysis

Completed

11/14/2011 00:00

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 4 pages for Acute Toxicity from ETT Environmental Inc.



P.O. Box 18414, Greenville, SC 29608

(864) 877-6942 • Fax (864) 877-6938

4 Craftsman Court, Greer, SC 29630

## **Ceriodaphnia dubia 48 Hour Acute Pass/Fail Test**

**EPA-821-R-02-012 Method 2002**

**Client: SCHLUMBERGER**

**Facility: Water Treatment Plant Effluent Discharge**

**NPDES #: SC**

**Test Date:**

**01-Nov-11**

**Laboratory ID#: T38748**

**Rogers & Callcott ID: AD12743**

**Test Reviewed and Approved By:**

Robert W. Kelley, Ph.D.  
QA/QC Officer

Farhad Rostampour  
Laboratory Director



**Certification #E87819**

Test results presented in this report conform to all requirements of

NELAC, conducted under NELAC Certification Number E87819

Florida Dept. of Health. Included results pertain only to provided samples.

**SCDHEC Certification #23104**

**NCDENR Certification # 022**



# **DMR Attachment for Pass/Fail Whole Effluent Toxicity Test Results**

TWELVE MILE CREEK RESTORATION PROJE Permit number SC  
FINAL LIMITS 04/01/2010- Parameter TGAJB

Discharge number  
MLOC=1 ATC=35.50% Effluent

Monitoring period From 

Year	Month	Day
11	11	01

 To 

Year	Month	Day
11	11	31

Mortality Data - Acute and Chronic Tests

Reproduction Data-Chronic Tests Only

Date 01-Nov-11  
Lab ID 23104

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control	20	0	Pass			
Test	20	0				

Mortality Data - Acute and Chronic Tests

Reproduction Data-Chronic Tests Only

Date \_\_\_\_\_  
Lab ID \_\_\_\_\_

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests

Reproduction Data-Chronic Tests Only

Date \_\_\_\_\_  
Lab ID \_\_\_\_\_

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests

Reproduction Data-Chronic Tests Only

Date \_\_\_\_\_  
Lab ID \_\_\_\_\_

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests

Reproduction Data-Chronic Tests Only

Date \_\_\_\_\_  
Lab ID \_\_\_\_\_

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests

Reproduction Data-Chronic Tests Only

Date \_\_\_\_\_  
Lab ID \_\_\_\_\_

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Signature of Principal Executive Officer or Authorized Agent \_\_\_\_\_

Name/Title of Principal Executive Officer (typed or printed) \_\_\_\_\_

DHEC 3420 (8/05)

		Control Survival and Reproduction by Test Day								Total
Source	rep	1	2	3	4	5	6	7	8	
BB10 10-2	A		0							0
F3 10-20	A		0							0
W8 10-21	A		0							0
O2 10-20	A		0							0
DD2 10-2	A		0							0
D5 10-20	B		0							0
Random	B		0							0
	B		0							0
	B		0							0
	B		0							0
	C		0							0
	C		0							0
	C		0							0
	C		0							0
	C		0							0
	C		0							0
	D		0							0
	D		0							0
	D		0							0
	D		0							0
										Mean
										0.0

		35.5 % Effluent Survival and Reproduction by Test Day								Total
Source	rep	1	2	3	4	5	6	7	8	
BB10 10-2	A		0							0
F3 10-20	A		0							0
W8 10-21	A		0							0
O2 10-20	A		0							0
DD2 10-2	A		0							0
D5 10-20	B		0							0
Random	B		0							0
	B		0							0
	B		0							0
	B		0							0
	C		0							0
	C		0							0
	C		0							0
	C		0							0
	C		0							0
	C		0							0
	D		0							0
	D		0							0
	D		0							0
	D		0							0
										Mean
										0.0

										03-Nov-11
										03:12 PM JS
										24.5

D=Dead N/A=Lost or not used

\*\*\*\*\*  
02:48 PM

NEO. FED TIME- 1350	T38748
SCHLUMBERGER	SCHLUMBERGER
SCHLUMBERGER	SCHLUMBERGER
SC	SC
0	0
11	11
11-1-11	11-1-11
1600	1600
16	16
Ceriodaphnia dubia	Ceriodaphnia dubia
10-31-11	10-31-11
BATCH 2	BATCH 2
SCAFF	SCAFF
MHSF	MHSF
%	%
35.5	35.5
30 ml	30 ml
15 ml	15 ml
1	1
16H/8dk	16H/8dk
24.6	24.6
none	none
none	none
EOA 621-R-02-012.2002	EOA 621-R-02-012.2002

Comments
NEO. FED TIME- 1350





**Attachment 3**

**Fourth Quarter Construction Photo Log**



**View of gabion basket installation.**



**View of seeding operations.**



**View of grading at the former topsoil stockpile area.**



**View of erosion control mat installation on SMU slope.**



**View of SMU west side, looking south.**



**View of SMU east side, looking south.**